

/INTERRELATIONSHIPS OF MANUFACTURERS' BRAND ADVERTISING
AND MARKET STRUCTURE IN THE FOOD MARKETING SYSTEM/

by

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0 Introduction

This paper deals with economic dimensions of manufacturers' brand advertising in distribution of food products. The paper constitutes a review of relevant literature on these economic issues. The focus is on the relationship among advertising, market structure, and competition. The paper is confined to positive analysis, although a discussion of the normative implications is important also.

Advertising plays an increasingly important role in food marketing, because many of these markets are characterized by low price elasticities and low and still decreasing, if not negative, income elasticities of demand. It seems likely that advertising takes over a role equal in relevance to price. Yet the discussion whether advertising is really pro-competitive or anti-competitive has been highly controversial.

From an extension of conventional price theory, the level of advertising in a market is expected to depend on market structure, that is on the number and size distribution of sellers. The analysis (ch. 2) is either static or dynamic, and considers the traditional types of market structure. To appreciate the specific competitive role of advertising, its informational function has to be analyzed. A theory of how consumers acquire information is given, from

which a relationship between advertising intensity, market structure, and product characteristics is derived (ch. 3). Advertising may change the manner in which consumers perceive a product's characteristics. Models of consumer choice which take this into account are discussed, and as an outcome, the possibility is considered that a high advertising level can serve as a barrier for new firms to enter a market (ch. 4).

The models which were discussed stem from two opposing schools of thought concerning the economic effects of advertising. The baseline of argumentation is given for both of them (section 5.1), with emphasis on the conflicting conclusions about the impact of advertising on the price elasticity of demand (section 5.2). In trying to resolve the seeming conflict, one has to take into account the vertical and horizontal structure of the food marketing system, comprising manufacturers as well as the distributive sector (section 5.3).

1 Functions of advertising in the policy of the firm

In a discussion of the effects of advertising, a useful point to depart from is to answer the question why firms employ advertising at all. In so doing, we confine to a certain form of advertising, namely brand advertising of manufacturing firms. In contrast, there exists advertising for a different type of advertised objects (generic goods) and that which is used by other subjects in the economic system (distributors' advertising).

In economic theory, we look at agents with a certain objective function. In the case of the firm, the most commonly used of these is the assumption that firms want to maximize profits. Also, sales maximization subject to a profit constraint, or maximization of firm growth are among the alternative assumptions for objective functions (Leibenstein, 1979, p. 479).

Under either of these final goals, a firm has to use a certain strategy, employing a mix of policy variables, to come as close to it as possible. Pricing is the policy variable of the firm which was first discussed in economic theory. Advertising is another important variable.

First of all, advertising performs a communicative function. It provides the potential buyers "facts" about the existence of a good or service and eventually transmits some real or perceived features of it. It is consciously

avoided to use the term "information" within this context, since its measurement is even more difficult than its definition, while for many people it is a word with positive associations. More of this issue is discussed in section 3.2 below¹⁾.

In general, the desirable effect of advertising from the firm's point of view is to raise demand for a product or brand. This may be important in various stages of the life cycle of the product. In announcing a new product, or, similar, creating a new market, advertising supposedly increases the speed with which that can be done, allowing

1) The marketing literature about advertising cannot be discussed fully in this report, but it seems worthwhile making up for this here. The reason is that much research in marketing is seeking explanations of how advertising affects buyer (or consumer) behavior. Concepts from consumer behavior research are applied to try to understand the mental processes which result in consumers' response to a certain message. The response sought may be at the cognitive, affective or behavioral level. One of several models of audience response, the AIDA model, presents the buyer as passing through successive stages of awareness, interest, desire, and action (Kotler, 1976, p. 325). Howard and Sheth (1969) developed a complex theory of buyer behavior. Embedded between input and output of the process, they recognize perceptual and learning constructs. Perceptual constructs serve the function of information procurement and processing relevant to a purchase decision. The buyer reduces the complexity of a buying situation with the help of information and experience, so that the decision process can take on quite different forms (Howard and Sheth, 1969, ch. 2). Some of the specific impacts that brand advertising may be expected to have on consumption behavior are "precipitation" to buy a product, persuasion to buy a certain brand of this product, reinforcement, and reminder to buy that product again (Sheth, 1974, quoted in Albion and Farris, 1981, p. 6).

the firm to reap higher profits from pioneering brands. Ads reminding customers to buy a product again may be able to extend its life cycle.

If markets are saturated in the short term (before some major change in technology or something similar causes old points of view about saturation to be overthrown), a firm may charge higher prices for its product than without advertising.

2 Optimal advertising level of the firm

While the "direct" effects of advertising given in section 1 can be fully discussed in a marketing framework, economists are especially interested in the aggregate outcome of firms' advertising for the market as a whole. The theories which I am going to present in the subsequent chapters deal with the relationship of advertising, market structure, and competition.

First of all, the optimum advertising level of the firm can be determined from extensions of traditional price theory. In this context, an influence of advertising on market structure is ignored, but the relationship is regarded as running unilaterally from structure to advertising level.

In perfect competition, each firm can sell its production

at a given price without undertaking any promotional efforts. If we relax the assumption of perfect information, firms might have to advertise even in pure competition. Indeed, there are forms of advertising like information on seller identity and reliability, price and terms of sale, which are compatible with this market model (Telser, 1964, p. 541). However, we expect advertising to be a more important action variable in markets with fewer firms, and therefore restrict the analysis to monopoly and oligopoly.

2.1 Optimal advertising level in monopoly

2.1.1 Static analysis

The simplest case in determining the profit-maximizing level of advertising is the one where advertising expenditures are the only action variable, i.e. price is fixed (Schmalensee, 1972, p. 20).

Let us observe a monopolist whose quantity sold of a product (Q) is a function of its price P and the number of advertising messages, A , which the firm releases in a period of time. We assume that each of these messages costs the firm T dollars, so that its advertising expenditures are AT . The firm's profit is

$$\pi = P Q(A, P) - C[Q(A, P)] - AT \quad (2.1),$$

where C denotes total production cost. The necessary condition for profit maximization is

$$d\pi/dA = P \cdot (dQ/dA) = (dC/dQ) \cdot (dQ/dA) + T \quad (2.2).$$

Defining the elasticity of demand with respect to advertising messages as $a = (dQ/dA) (A/Q)$ (2.3),

it follows from eq. 2.2 that

$$P \cdot a = (dC/dQ) \cdot a + AT/Q \quad \Rightarrow \quad a \cdot (P - dC/dQ) = AT/Q$$

$$\Rightarrow \quad a = \frac{A \cdot T}{Q (P - \frac{dC}{dQ})} \quad (2.4).$$

(2.4) can be rearranged to yield

$$\frac{A \cdot T}{P \cdot Q} = \frac{a \cdot (P - \frac{dC}{dQ})}{P} \quad (2.5).$$

The left side of (2.5) denotes the ratio of advertising expenditures to sales revenues, which is defined as advertising intensity. The optimum condition states that this term should equal the product of the advertising elasticity of demand and the Lerner measure of the degree of monopoly $(P - MC)/P$.

In an extension of this analysis, the monopolist also varies price. To obtain all necessary conditions for profit maximization, we have to take the derivatives of (2.1) with respect to both advertising messages and price (Dorfman and Steiner, 1954):

$$\frac{\partial \pi}{\partial A} = P \cdot \frac{\partial Q}{\partial A} - \frac{\partial C}{\partial Q} \cdot \frac{\partial Q}{\partial A} - T = 0 \quad \Rightarrow \quad \frac{\partial C}{\partial Q} = P - \frac{\partial A}{\partial Q} \cdot T$$

$$\frac{\partial \pi}{\partial P} = P \cdot \frac{\partial Q}{\partial P} + Q - \frac{\partial C}{\partial Q} \cdot \frac{\partial Q}{\partial P} = 0 \quad \Rightarrow \quad Q + (P - \frac{\partial C}{\partial Q}) \cdot \frac{\partial Q}{\partial P} = 0 \quad \Big| \cdot \frac{P}{Q}$$

$$\Rightarrow P = (P - \frac{\partial C}{\partial Q}) \cdot E \Rightarrow \frac{\partial C}{\partial Q} = P \cdot (1 - \frac{1}{E})$$

$$\text{So that } P - \frac{\partial A}{\partial Q} \cdot T = P - \frac{P}{E} \Rightarrow \frac{A \cdot T}{P \cdot Q} = \frac{a}{E} \quad (2.6)$$

(2.6) states that the firm will spend money on advertising up to the point where its advertising intensity equals the ratio of the advertising elasticity of demand to the negative of the price elasticity of demand. It indicates a lower advertising intensity for goods with a high price elasticity of demand, *cet. par.*, and a relatively intensive use of advertising in selling products like food, which are demand inelastic. (This is a very tentative conclusion, since the statement pertains only to food as a group of consumption goods.)

2.1.2 Dynamic analysis

Up to now, it was implicitly assumed that current advertising spendings do not affect the future demand for the product. Now we consider the fact that "the effects of a given advertising campaign, both upon the number of consumers and their tastes, tend to persist for a considerable period following the campaign, albeit, ..., to a steadily diminishing extent" (Nerlove and Arrow, 1962, p. 130). To reflect this, it is assumed that the product possesses a

goodwill stock S , which summarizes the effects of current and past advertising expenditures on demand. This goodwill stock tends to shrink over time at a depreciation rate δ , if it is not replenished by new advertising. The rate of change in S at any given point of time is then

$$dS/dt = A - \delta S \quad (2.7).$$

If we let demand explicitly depend on time, then the profit at any time is

$$\pi(t) = PQ - C(Q) - AT = R(Q) - AT \quad (2.8),$$

where $Q = f(P, S, z)$, R is revenue net of production expenses, and $z(t)$ denotes all variables not under control of the firm. An optimal policy for the firm is the one which maximizes the present value of the stream of profits, i.e. which maximizes

$$PV\{P, S\} = \int_0^{\infty} e^{-rt} [R(P, S, z) - A] \quad (2.9).$$

The maximum of PV is found by first maximizing it with respect to price, holding S fixed, and then maximizing the result with respect to S by an appropriate choice of the time path of A (Nerlove and Arrow), 1962, p. 132). The first of these steps involves equating marginal gross revenue to marginal production costs at each point of time:

$$\partial \pi / \partial P = Q + P \cdot (\partial Q / \partial P) - (\partial C / \partial Q) \cdot (\partial Q / \partial P) = 0 \quad (2.10).$$

If we solve (2.10) for the optimal price policy \hat{P} as a function of S and z , $\hat{P}(t) = P(S, z)$, and insert the result

in (2.9), we obtain a new problem, namely to maximize

$$\hat{P}V\{S\} = \int_0^{\infty} e^{-rt} [\hat{R}(S, z) - A] dt \quad (2.11)$$

subject to (2.7) and with $S(0) = S_0$. (2.7) determines A if S is given, so that an optimal solution for S gives an optimal solution for A .

It can be shown (Nerlove and Arrow, 1962, p. 132-134) that maximizing (2.11) is equivalent to maximizing

$$\pi(S, z) = \hat{R}(S, z) - (r + \delta) \cdot S \cdot T \quad (2.12)$$

subject to (2.7) and $S(0) = S_0$. Under certain assumptions, the necessary condition is

$$\begin{aligned} \partial \pi(S, z) / \partial S &= \partial \hat{R}(S, z) / \partial S - (r + \delta) \cdot T \\ &= \hat{P} \cdot (\partial Q / \partial S) - (\partial C / \partial Q) \cdot (\partial Q / \partial S) - (r + \delta) \cdot T = 0 \end{aligned} \quad (2.13)$$

where $Q = f[\hat{P}(S, z), S, z]$. Eq. 2.13 states "that at the optimal price ... , the marginal revenue from increased goodwill net of the marginal costs of producing the increased output should be equal to the marginal opportunity cost of investment in goodwill" (Nerlove and Arrow, p. 134, fn. 1).

From (2.10), it can be derived that

$$P = (\partial C / \partial Q) \cdot (E/E-1) \quad (2.14),$$

and, expressing the marginal costs $(\partial C / \partial Q)$ in terms of P , (2.13) can be simplified to

$$\begin{aligned} 0 &= (\hat{P} - \hat{P} \frac{E-1}{E}) \cdot S \cdot \frac{Q}{S} - (r + \delta) T \\ &= \hat{P} \cdot \frac{1}{E} \cdot S \cdot \frac{Q}{S} - (r + \delta) T \end{aligned}$$

$$\frac{S \cdot T}{A \cdot Q} = \frac{s}{E} \cdot \frac{1}{(r + \delta)} \quad (2.15)$$

where s is the elasticity of demand with respect to the goodwill stock, $(dQ/dS) \cdot (Q/S)$. Advertising expenditures then should be adjusted to attain this desirable ratio of goodwill stock to sales. If the goodwill stock S is below the optimum level, the firm should advertise as much as possible, or cut advertising spendings drastically, if S is too large (Schmalensee, 1972, p. 23).

Schmalensee dismisses this model, because it claims a constant ratio of goodwill stock to sales, "but then the flow variable, advertising spending, will depend on the change in sales ... [But] advertising spending seems to be related to the level of sales, not to the change in sales" (1972, p. 24). Furthermore, the unobservability of S makes it difficult to formulate a testable advertising decision equation based on this model (ibid., p. 25).

Instead, he proposes the following model of consumer demand: at every moment of time there is an equilibrium demand given by $Q^* = Q^*(A, P, t)$, and actual demand Q moves towards Q^* at all times, with an adjustment mechanism like

$$dQ/dt = \lambda \cdot (Q^* - Q) \quad (2.16).$$

Actual demand Q is not generally equal to Q^* because of

costs of change and of breaking habits. Defining the long-run elasticities of demand with respect to advertising messages and price as a^* and E^* , respectively, Schmalensee shows (1972, pp. 27-29) that the necessary condition for maximizing the present value of profits is

$$AT/PQ = a^*/E^* \quad (2.17).$$

This is the equivalent of the Dorfman-Steiner formula (2.6).

2.2 Optimal advertising level in oligopoly - static analysis

The previous discussion dealt with a firm that was able to set the price and need not care about the reactions of competitors, in other words, it acted like a monopolist. The following model depicts the situation in undifferentiated oligopoly, where the quantity sold by firm i (q^i) is a function of the number of its advertising messages, A^i , the advertising of all its competitors, \bar{A}^i , and the industry price P , which is assumed to be exogenous (Schmalensee, 1972, p. 33; cf. Needham, 1978, p. 84/5). The firm's profit function is

$$\pi^i = P \cdot q^i(A^i, \bar{A}^i, P) - C^i[q^i(\bar{A}^i, A^i, P)] - A^i T \quad (2.18).$$

Setting the derivative of π^i with respect to A^i equal to zero gives the necessary condition for maximum profit

$$\frac{\partial \pi^i}{\partial A^i} = P \cdot \left(\frac{\partial q^i}{\partial A^i} + \frac{\partial q^i}{\partial \bar{A}^i} \frac{\partial \bar{A}^i}{\partial A^i} \right) - \frac{\partial C^i}{\partial q^i} \left(\frac{\partial q^i}{\partial A^i} + \frac{\partial q^i}{\partial \bar{A}^i} \frac{\partial \bar{A}^i}{\partial A^i} \right) = T \quad (2.19)$$

The firm's decision about advertising will be affected by

- the effectiveness of its own advertising on sales when rivals' advertising remains unchanged, labeled a^i , i.e.

$$a^i = (\partial q^i / \partial A^i) \cdot (A^i / q^i) \mid \bar{A}^i = \text{const.};$$

- the impact of rivals' advertising on the i -th firm's sales, measured by the elasticity $\bar{a}^i = (\partial q^i / \partial \bar{A}^i) \cdot (\bar{A}^i / q^i)$; a^i will be negative with the exception of some very new industries, in which the advertising of one firm benefits all firms, because it makes buyers aware of the industry's existence (Schmalensee, 1974, p. 581).

- the way how competitors adjust their amount of advertising to a change in firm i 's advertising, or, more precise, what firm i conjectures about competitors' reaction, measured by the conjectural response elasticity $\eta^i = (\partial \bar{A}^i / \partial A^i) \cdot (A^i / \bar{A}^i)$.

Using these expressions, eq. 2.19 changes to

$$\left(P - \frac{\partial C^i}{\partial q^i} \right) \cdot \left(a^i \cdot \frac{q^i}{A^i} + \bar{a}^i \cdot \frac{q^i}{\bar{A}^i} \eta^i \cdot \frac{\bar{A}^i}{A^i} \right) = T$$

$$\frac{A^i \cdot T}{P \cdot q^i} = \left(P - \frac{\partial C^i}{\partial q^i} \right) / P \cdot \left(a^i + \bar{a}^i \cdot \eta^i \right) \quad (2.20)$$

where the first bracket on the right side contains the Lerner measure of the degree of monopoly. For profit

maximization, this measure has to be equal to the reciprocal of the firm's price elasticity of demand. Therefore, (2.20) is consistent with (2.5).

Among several implications of this condition is the one that the optimal advertising-sales ratio is larger, the smaller the increase in the level of rival sellers' advertising which is anticipated by the firm. In other words, if η^i is small, the product $\bar{a}^i \cdot \eta^i$ will in general be a negative number with a small absolute value, resulting in a higher figure for the right side of the equation. If \bar{a}^i is equal to zero, (2.20) is the equivalent to (2.5): the firm acts like a monopolist.

We can refine the analysis further by extending eq. 2.6, since in oligopoly, the elasticities of firm and market level diverge. The firm's advertising elasticity of demand is

$$a = a^i + \eta^i \cdot \bar{a}^i \quad (2.21),$$

which is smaller than a^i if the firm conjectures that the competitors will adjust their advertising spendings in the same direction as it does.

For the firm's price elasticity of demand E^i ,

$$\begin{aligned} E^i &= (-) \frac{\partial q^i}{\partial P} \frac{P}{q^i} = (-) \frac{(\partial Q - \partial \bar{q}^i)}{\partial P} \cdot \frac{P}{q^i} \\ &= (-) \frac{\partial Q}{\partial P} \cdot \frac{P}{Q} \cdot \frac{Q}{q^i} + \frac{\partial \bar{q}^i}{\partial P} \cdot \frac{P}{\bar{q}^i} \cdot \frac{\bar{q}^i}{Q} \cdot \frac{Q}{q^i} \\ &= \frac{E}{S^i} + \bar{E}^i \frac{\bar{q}^i}{Q \cdot S^i} = \frac{E}{S^i} + \bar{E}^i \frac{\bar{S}^i}{S^i} \end{aligned} \quad (2.22)$$

where P is the uniform industry price, \bar{q}^i is the quantity sold by all rivals, \bar{E}^i is the rivals' price elasticity of supply, s^i and \bar{S}^i are the market shares of firm i ($S^i = q^i/Q$) and all its rivals ($\bar{S}^i = \bar{q}^i/Q$), respectively (Needham, 1978, p. 59).

Regarding the quantities in (2.6) as advertising and price elasticity of demand at firm level, substituting (2.21) and (2.22) into (2.6) leads to

$$\frac{A^i \cdot T}{P \cdot q^i} = \frac{(a^i + \eta^i \cdot \bar{a}^i)}{\frac{E}{S^i} + \bar{E}^i \cdot \frac{\bar{S}^i}{S^i}} \quad (2.23)$$

(Needham, 1978, p. 87), which combines all relevant variables for determining the optimal advertising-sales ratio.

Another interesting question to ask is how advertising intensity is related to the number of firms in the oligopolistic market. Assume that a firm's market share S^i is determined by its share of 'effective' advertising, which is a function of the number of advertising messages released by the firm. Assuming that advertising is equally effective for all N firms in the market,

$$S^i = f(A^i) / \sum_{j=1}^N f(A^j) \quad (2.24)$$

(Schmalensee, 1972, p. 35). Furthermore, we assume

- the elasticity of effective advertising with respect to

changes in the number of advertising messages is constant and equal for all firms;

- the value of the Lerner-index does not depend on N ;
- all firms have identical cost functions.

Then the nature of the advertising equilibrium depends on firms' expectations about the response of the competitors, measured by η^i . In a Cournot-like model, with all conjectural elasticities equal to zero, it can be demonstrated that advertising-sales ratios rise with N . Even when the advertising elasticity of demand for the industry is zero, i.e. sales can not be expanded through increased advertising, the oligopolists will advertise to compete for market shares (Schmalensee, 1972, p. 37).

There is some evidence for the assumption that the conjectural elasticities are zero for advertising. However, it is more reasonable to think of the degree of monopoly power as depending on the number of firms. Then it is proposed that advertising intensity reaches its maximum for a number of 1, 2, or 3 firms, depending on the values of the price and advertising elasticities of demand, E and a (ibid., p. 38/9).

Besides demonstrating the impact of market structure on advertising level, the analysis in the preceding sections provides some rationale for rules of thumb used by businessmen who choose their firm's advertising expenditures as a constant percentage of sales. If the relevant elasti-

cities are constant, such a procedure may be optimal, provided the correct ratio of dollar advertising to dollar sales is applied (Schmalensee, 1972, pp. 18, 39).

3 Market structure and information content

of advertising - search goods versus experience goods

3.1 Characteristics of markets with imperfect information

In markets in the real world, a variety of commodities is traded which differ in quality and style, so that we have to deal with differentiated products. Other factors of product differentiation are the amount of service, the terms of sale, like quantity of contracts, and credit arrangements. But even after correcting for these differences among commodities, the prices quoted for a given product by several sellers are dispersed, that is they show a certain probability distribution instead of a single number (Stigler, 1961, p. 214).

Obviously, this fact is incompatible with the assumption of perfect information of economic agents. Therefore we have to relax this assumption and instead look for the factors which determine the degree of information in a market, again confining to consumers, since the analysis refers to food products which are consumer goods.

A large dispersion of the price of a homogeneous product is a sign of consumer ignorance. To reduce ignorance, consumers have to gather information about the product, or, more precisely, about its characteristics. Price is a product characteristic for which information is often relatively easy to get, although the costs of information

are never zero. But since it takes only a short amount of time to acquire knowledge about product price, the opportunity costs of used time are supposedly low.

"Information about quality differs from information about price because the former is usually more expensive to buy than the latter" (Nelson, 1970, p. 311). As a consequence, buyers are able to ask for and to compare prices of a brand of cereal at different retail stores, and compare also prices of different brands, but the determination of quality is a far more complex task, since it comprises features like kind of ingredients, nutritional value, flavor, and more.

The interesting questions in this context are:

- (1) which factors determine buyers' behavior in obtaining information as well as in purchasing products?
- (2) What is the role of advertising in these processes, and
- (3) what is the predicted relationship between product type, market structure, and advertising level?

3.2 Theory of information acquisition

Consumers derive information from various sources, and each of these has its distinct costs and characteristics, so that the effective importance of different sources in contributing to consumer information changes from product

to product (cf. Comanor and Wilson, 1974, p. 12, and Nelson, 1974, p. 747, for the following part).

One method of acquiring information is best described as a search process. While the consumer can ask sellers or middlemen, he is also gaining information from other consumers' knowledge about the product, e.g. friends and relatives. They can provide guidance in the search process, as can also consumer magazines which test products and publish their results.

Another source of information consists of advertising messages which are part of sellers' promotional efforts. They have in common that they are transmitted to the potential buyer through some kind of medium, either print or electronic.

Obtaining information by search may be defined as evaluating the utility of an option by inspecting the option prior to purchase. In contrast, consumers might purchase a product and evaluate its utility in that way, that is they use own experience as a source of information. (Guidance by other consumers is in part an outflow of their experience with the product, too.)

Up to now, the term "information" was used several times without defining it. Nelson (1970, p. 730) states that information is generated by advertising because of consumer power in the product market. For goods most of whose

important qualities can be determined prior to purchase (via search), advertising is supposed to provide information about all of these qualities (Nelson, 1975, p. 220). The connotation in his papers is clear: information is something which is "good and useful". Therefore, informative advertising, for example, is put opposite to deceptive advertising (ibid., p. 749).

It turns out that there exist two quite different definitions of "information" (Pope, 1985, p. 69). One is that information is everything which reduces uncertainty or the dispersion of probabilities. We may assume that with perfect information, consumers' expectations about the performance of a product are in line with the true product characteristics, and the variance concerning this expectation is then zero (Comanor and Wilson, 1974, p. 28/9).

But we have to take notice of an alternative definition (Pope, 1985, p. 70). Information is all external stimuli which alter beliefs - opposite to processes of subjective evolution which may have the same effect¹⁾.

For obtaining information by search, we look at a sequential search process. We can think of a consumer driving around and checking several retail stores for the price they charge for a certain brand of cereal. Whatever the

1) Quantitative measures congruent with this definition of information also exist (Pope, 1985), but will not be discussed here.

exact distribution of prices among retail outlets, increased search will yield a lower minimum price on the average. For any buyer, the expected savings from one additional step of search will be the quantity q he wishes to purchase times the expected reduction in minimum price as a result of the search, or

$$q \cdot \left| \partial P_{\min} / \partial n \right| \quad (3.1)$$

where n is the number of search steps (Stigler, 1961, p. 215). We may also call this expression (3.1) the marginal revenue of search.

The main cost factor involved for consumers is time, and in the example, we can assume that it takes about the same amount of time to go to each store, so that the marginal cost of search is constant, if the opportunity cost of time is assumed to be constant. The optimal number of search steps is attained when marginal revenue and marginal cost are equal (*ibid.*, p. 216). Provided the marginal revenue was higher at the beginning of search at all, this condition is probably fulfilled at a certain number n , because the marginal revenue of search is decreasing (independent from the exact distribution of prices). The consumer can then choose the best of the set of alternatives he has examined. If he knows about the probability density function of prices *ex ante*, he could also determine the optimal number of search units in advance. But

this is unlikely in reality, so a more appropriate theory of search must consider a sequential decision process in which a control for optimality is built in after each search unit (Nelson, 1970, p. 313). The following part is based on the prior decision model, however.

The analysis presented above applies also to brand choice: instead of prices for one brand, prices and quality features of different brands are now compared. In this case, demand for a manufacturer's brand or product is influenced by the outcome of the consumer's decision. Therefore, this is a more relevant application of the theory in our context, and is pursued in the following section.

For this more general situation, marginal expected revenue for the n -th search step is the difference between the expected present value (EPV) of the utility of the best option in n searches minus this expected value for $n-1$ searches, or

$$MR_n = EPV(B_n) - EPV(B_{n-1}) \quad (3.2).$$

This formulation implies that this marginal revenue is reaped in continued purchase of the commodity over a certain period of time. One search process could therefore provide information for a series of purchases.

It should be obvious by now that the gathering of information by experience requires another optimality calculus.

Experience is the appropriate mechanism of obtaining information when search is too costly, i.e. marginal revenue is lower than marginal cost of search. In the case of the price comparison example, this is a consequence of either a small expected decline in average minimum price or of a minor quantity purchased per period of time. The expected decline in price is small, if either the expected value of the probability density function of prices is small (in common language: the product is cheap), or the variance is small.

The quantity referred to can be purchased at several occasions in a certain time period, provided that the characteristics of a brand or at least their relation to those of competing brands stay roughly constant in this period. Under this condition, one search process would be sufficient for a number of subsequent purchases, as is implied in the derivation of eq. 3.2.

It appears that most food products carry features like the ones described above. Not only is their price per unit quite low and the size of purchase units (q 's) small, but they are also purchased frequently, a fact which - as we shall see below - tends to make them so called experience goods (opposite to search goods). This means that most information about them is obtained by experience rather than by search.

To analyze the experience case of brand choice, the

assumptions are (Nelson, 1970, p. 313/4):

- in trying to experience different brands by purchase, consumers sample at random among brands;
- having experienced m brands of the same product, the consumer is able to determine his most preferred brand in the sample;
- this most preferred brand will stay the same over time.

Marginal revenue from sampling is identical with the search case, but marginal cost will differ. The consumer, after purchasing a certain number of different brands, must decide whether he wants to extend his sample size and try another brand at random, or stay with the best item he has already discovered. The first possibility offers a utility of the purchase equal to the expected value (u) of the utility distribution (i.e. probability density function) of all brands. The second will yield a utility equal to the expected value of the utility of the best brand in $n-1$ random choices (B_{n-1}), so that the marginal cost of the n -th trial is

$$MC_n = E(B_{n-1}) - u \quad (3.3),$$

the loss in utility from consuming a brand at random rather than using the best brand one has already discovered (Nelson, 1970, p. 314).

The optimal number of experiments is determined where marginal revenue just exceeds or is equal to marginal

cost. First, the expressions in eq. 3.2 must be transformed to present value terms. The number of experiments n is then given by

$$E(B_{n-1}) - u \leq [E(B_n) - E(B_{n-1})] \cdot \frac{1}{s} \cdot \left(1 - \frac{(1+s)^1}{(1+s)^{ft+1}} \right) \quad (3.4)$$

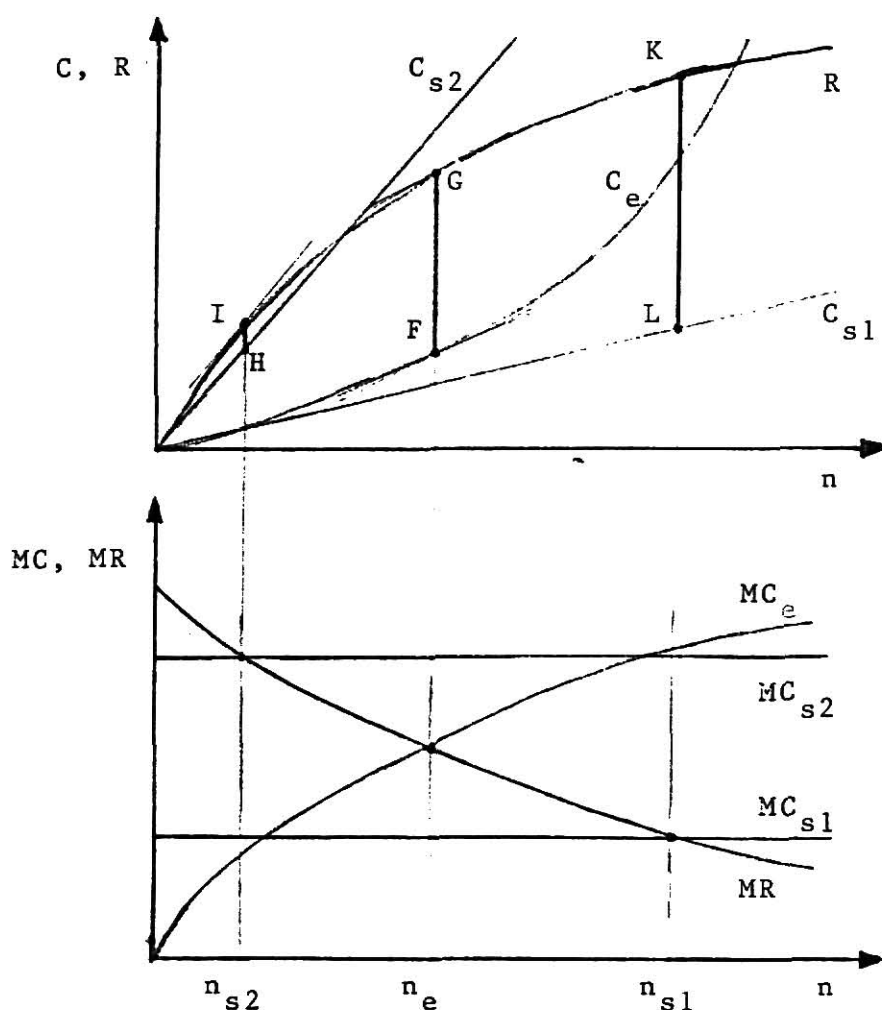
where f = number of times per year the product is purchased; t = number of years over which purchases will occur; and s = interest rate over the period of one purchase.

So far, the optimum conditions for the search and the experiment case have been analyzed separately. But as explained before, the consumer has the choice of obtaining information about a certain product by either search or experience. "The cost of experimenting sets an upper limit to the cost of search that a person is willing to undergo ... Hence, we would expect the decision to search for a good to lead to a greater sample size than the decision to experience that good" (Nelson, 1970, p. 317).

Why is this so? To illustrate this graphically (cf. fig. 3.1), let us look at the sampling process as a continuous one, so that we have continuous cost and revenue functions. For a certain good, the marginal revenue for each additional step of obtaining information is essentially the same for both methods, search and experience. The marginal revenue curve in figure 3.1 is decreasing at a decreasing rate, so that it will never become negative,

for it is always the case that the best brand of a larger set will tend to have a higher utility in future consumption. Also, the marginal cost curve for experiencing (MC_e) is given, if we look at a certain good: it is increasing at a decreasing rate, starting at zero. From eq. 3.3, it is obvious that for $n=2$, $MC_2 = 0$, since $E(B_1) = u$. The shape of the marginal cost function for

Fig. 3.1: Determination of the method
of obtaining information for a given good



experiencing depends upon the probability density function of the utilities of brands (as does the marginal revenue function).

The marginal cost for searching, MC_s , is not given for a certain product, but depends on the opportunity cost of time which changes with a consumer's income. In fig. 3.1, assuming constant marginal cost of search, two situations are depicted. MC_{s1} implies a lower opportunity cost of time than MC_{s2} .

The optimum sample size for experience is given by n_e , for which $MR = MC_e$, and the difference between total revenue and total cost is \overline{GF} . For marginal cost of search at level 1, the optimal sample size (for which $MR = MC_{s1}$) is $n_{s1} > n_e$, and the total net revenue \overline{KL} is also greater than in the previous case. But if the marginal cost of search is as high as level 2, the optimal sample size will be smaller ($n_{s2} < n_e$), as will the total net revenue ($\overline{IH} < \overline{GF}$). This is Nelson's result: if the absolute conditions (comparison of net revenue) show that obtaining information by search is optimal, then the optimal sample size will be greater than if information were obtained by experience.

For different goods, therefore, one is able to predict a larger sample size for search than for experience goods, holding frequency of purchase constant (Nelson, 1970, p. 317/8). With increasing frequency of purchase, eq. 3.4

shows that the optimal sample size for experiment goods rises too. Looking at food products, this means that they are adequately classified as experiments goods. For if they were search goods, the sample size had to be even larger, in a range where marginal revenue would be too low.

3.3 Market structure and product type

We are now at a point to answer a part of the third question formulated above (p. 19), namely the relationship between product characteristics and market power which itself is related with market structure.

Only those brands which are in consumers' samples can compete in a market. The price elasticity of demand facing a brand is a function of the number of close substitutes which a consumer can compare: the larger the number of substitutes, the larger is also the price elasticity of demand (in absolute value). Also, this elasticity for the brand (E) is a true measure of monopoly power; the Lerner index of monopoly power [$L = (P - MC)/P$] is equal to the reciprocal of E if the firm maximizes profit for the brand (cf. ch. 2). A low price elasticity of demand for a brand implies a high degree of monopoly power for the firm selling it.

In the previous discussion, we saw that the optimal sample size will be higher for search goods than for experiment goods. If all consumers regarded the same brands for their samples, this optimal number would be the upper limit to the possible number of brands on the market (Nelson, 1970, p. 317). This type of uniform consumer choice is unlikely; however it is reasonable to assume some positive correlation in the identity of brands which get into different consumers' samples.

The hypothesis is (ibid., p. 320): on markets for experience goods, there is a tendency for higher monopoly power of sellers than on markets for search goods (which carry a larger number of brands).

To test this hypothesis empirically, Nelson first classifies goods into both categories, using different criteria for durable goods (with a low frequency of purchase) and nondurable goods (high frequency of purchase): durable experience goods are those with a high ratio of repair expenditures to sales. It is of some interest to see how he establishes this criterion, since this is one of the most critical elements of the test. He uses the level of repair expenditures for measurement, but what he really means is their variance. For a high variance of repair expenditures indeed indicates that consumers prefer to evaluate one important aspect of product performance - reliability - by experience rather than by search. Nelson

thinks it is "reasonable to assume that the variance in repair expenditures will be a function of the level of repair expenditures" (ibid., p. 318). Almost all nondurable goods are classed as experience goods, among them food products, because for all these, sampling (or better, "inspecting" before purchase) is destructive.

Despite the somewhat problematic classification procedure, the postulated hypothesis is supported in a test, using 1958 concentration ratios as a proxy variable for monopoly power (ibid., p. 320).

3.4 Advertising and product characteristics

Now a relationship between market structure and information category is established, but advertising has not yet entered the picture. Earlier, advertising was listed as one of several sources of information (section 3.2). It is not the sellers' primary intention to provide information, but it is generated by consumers' market power.

In the case of search goods, if the advertised properties of the product differ from the actual properties, Nelson claims that the consumer will know about the difference prior to purchase (Nelson, 1974, p. 730). This reduces the incentives for misleading advertising which nevertheless still exists.

For experience goods, consumers' power over advertising is much smaller than for search goods, so that the content of 'direct' information (i.e. information in the advertising statement) is admittedly lower (ibid., p. 732). But ads for experience goods also transmit 'indirect' information, as consumers recognize that the brand is advertised. Nelson postulates: "The consumer believes that the more a brand advertises, the more likely it is to be a better buy. In consequence, the more advertisements of a brand, the more likely he is to try the brand" (ibd.).

While this statement is quite intuitive, another essential part of Nelson's theory has to be explained: he claims that advertised products are indeed better buys, not just perceived as those by consumers. The main reason is the following one: some firms produce brands that yield more utility to the customer for a dollar of production cost than others. These low cost firms can provide the brand at a lower price per unit of utility and will find it worthwhile advertising the brand to increase their sales.

In the next step, the optimal number of advertising messages for search and experience goods is discussed, considering the different quality of advertising in both categories (Nelson, 1974, p. 735 ss.). For search goods, we assume that advertising will increase sales when it gives the consumer information that he did not have

before. Assuming further that each advertising message about a given search brand has the same information content, the effectiveness of advertising depends on the proportion of potential customers which received one or more of those advertising messages. Even to keep this proportion constant over time, a certain advertising intensity is required, for consumers leave and enter the market, and they forget advertising information.

In the case of experience goods, we have to regard the different function of advertising messages: they transmit little direct information, but through repetition, convince the consumer that this brand is a good buy. Thus, they improve the reputability of the brand and the advertising firm. Consumer sampling does no longer occur at random, but is influenced by advertising. It is suggested that there exists a critical number of advertising messages a consumer must have received before he purchases the brand.

In comparing the two categories of goods, it then becomes clear that the optimal advertising intensity for firms offering experience goods will be higher than the one of firms offering search goods. There is empirical evidence in support of this hypothesis, using different classification procedures for goods (Nelson, 1974, p. 739). For food products as experience goods, a relatively high advertising-sales ratio is proposed in general.

3.5 Synthesis of results

Putting the pieces together: for markets of experience goods, a relatively high degree of monopoly power was found as well as high advertising-sales ratios. The question is whether this positive association between the two findings indicates a causal relationship from one to the other.

The relatively high monopoly power for sellers in some markets is created by product characteristics, or, in other words, the method of obtaining information used by consumers. The direct information content of advertising is inversely related to the degree of producer market power, so it is low for experience goods. Here, a high advertising intensity is associated with a small amount of direct informational content, but one has to be cautious in stating a causal relationship between the degree of producer market power and advertising intensity. Rather, both of them seem to be dependent on product type.

4 Advertising and barriers to entry

4.1 Propositions to start with

A crucial assumption of all the models discussed before was this one: all firms' advertising effectiveness is identical, other things being equal, i.e. given the same level of advertising, or, more precisely, the same number of advertising messages. This assumption does not exclude that the marginal and average effectiveness of advertising changes with advertising intensity, but it is in contrast to the two following propositions:

- advertising for products of firms which already operated in a market for a certain time (called 'established', 'incumbent', or simply 'old' firms) is more effective than that for products of firms which are just going to enter this particular market.
- Advertising for products of large firms which supposedly release a bigger number of advertising messages, is more effective than that of small firms, other things being equal.

The first of these points pertains to the underlying assumptions in Nelson's model about consumer behavior, especially consumer choice among brands. The consumer applies an optimization procedure to the process of obtaining information, a process in which the relevant characteristics of a brand are inspected and compared with those

of other brands, either prior to or after purchase. Repeated purchase of one brand is interpreted as the outcome of an optimization process which takes a high degree of rationality, and as a sign of consumers' market power.

Nelson assumed, however, that a consumer's most preferred brand stays the same over time, a condition which prevents the consideration of the impact of new brands or, more generally, a change in consumers' ranking among brands. His characterization of repeated purchases would hold, if the cost of obtaining information is considered to be so low that the optimization procedure mentioned above can be checked and updated after a certain time interval. In reality, these costs may frequently be sufficiently high relative to returns, so that this mechanism does not work. Repeated purchases of a brand may then be characterized as brand loyalty, an outcome of habitual behavior (which is nevertheless rational), designed to reduce uncertainty in decision-making by reliance on procedures which have proved themselves in the past (Comanor and Wilson, 1974, p. 24).

Advertising is a cheap and easily obtainable and digestible source of information, so it plays an important role especially in a process explained as habitual behavior. In buying advertised brands, consumer search a warranty for product performance, so that advertising

takes over the function of reducing uncertainty which is designed to the complicated optimization procedure in a genuine decision-making process.

A model of consumer choice is presented now which covers the proposition stated above. We can look at consumer choice as a sequential decision process where the choice among alternative commodities is followed by the choice among different brands of a commodity (Comanor and Wilson, 1974, p. 22). Since we are interested in explaining the relationship between advertising and the structure within a market, and less between advertising and market demand, we focus on the second step of the decision process, brand choice.

4.2 A model of consumer brand choice under uncertainty

We look at a person who maximizes utility from consumption of two brands of a commodity by buying q_1 of brand I and q_2 of brand II. It will be useful to consider the first brand as that of a "representative product" that is sold by an established firm in the market whereas brand II is less well-known. If we assume that the two competing brands are highly substitutable for each other, and also assume constant marginal utility from consumption of each brand, the utility function for an individual consumer can

be written as

$$U = q_1 U_1 + q_2 U_2 \quad (4.1),$$

where $U_i = \partial U / \partial q_i$.

The consumer has to maximize this function subject to a budget constraint which is given by the outcome of step 1 of his decision process, i.e. how much he wants to spend on a particular commodity. Assuming that his budget need not be spent completely, that is where we have an inequality constraint, the problem is solved by formulating the Lagrangian expression and deriving the Kuhn-Tucker first-order conditions for a maximum. The products are perfect substitutes, or, graphically, the isoutility curves are straight lines. Therefore, the expected result is a corner solution: the consumer will never buy a combination of the two brands, but will purchase brand I if

$$\frac{U_1}{U_2} > \frac{P_1}{P_2} \quad (4.2),$$

and brand II if the inequality sign is the other way (Comanor and Wilson, 1974, p. 26):

$$\frac{U_1}{U_2} < \frac{P_1}{P_2} \quad (4.3).$$

Suppose for the moment that the consumer derives more utility per unit of the 'representative' brand than from the other one. For the consumer to purchase the second brand under this condition, its price P_2 must be sufficiently lower so that

$$(\beta =) \frac{U_1}{U_2} - 1 < \frac{P_1}{P_2} - 1 = \frac{P_1 - P_2}{P_2} \quad (4.4).$$

β is the minimum percentage markdown in price for the second brand required to induce the consumer to purchase it.

The next step is to ask for the factors which determine U_1 and U_2 , and therefore the possibly required price discount for a new firm's brand. Comanor and Wilson (1974, p. 27) assume that the utility of a brand depends on how the consumer subjectively perceives its performance at the time of purchase, as opposed to actual performance. a_i is an index of perceived performance of the i -th brand, and Ea_i is its expected value. Another important assumption is that consumers are risk averse: a greater variance in perceived product performance (Va_i) results in a lower marginal (or average) utility. The equation

$$U_i = \alpha_1 \cdot Ea_i - \alpha_2 \cdot Va_i \quad (4.5)$$

indicates that U_i is assumed to be a linear function of expectation and variance of subjectively perceived performance. The nonnegative coefficients α_j are equal for all brands within the class; α_2 is the degree of risk aversion.

Ea_i and Va_i in turn are supposed to depend linearly on the degree of information about brand i , X_i , $0 \leq X_i \leq 1$, so that

$$Va_i = (1-X_i) \cdot V\bar{a} \quad (4.6)$$

where $V\bar{a}$ is the subjective variance of the distribution of

product quality in the absence of information. Note that with perfect information ($X_i = 1$), Va_i is zero, that is the consumer is certain about the true variance in product performance. This ex post variance is included in the index of product performance, a_i .

Denoting the "true" product performance with \bar{a}_i and the mean product performance of the leading brands in the market with \bar{a} ,

$$Ea_i = X_i \cdot \bar{a}_i + (1 - X_i) \cdot K \cdot \bar{a} \quad (4.7).$$

The constant K ($K > 0$) differs between consumers and plays a role if little information is available. It allows explicit recognition that people have different opinions toward new products. A value of K less than unity means that in the absence of information, $Ea_i < \bar{a}$: the consumer views the new brand i then as below standard.

We can substitute from (4.6) and (4.7) into (4.5) for $i = 1, 2$; and the result into (4.4) gives us

$$\begin{aligned} \beta &= \frac{X_1 (\alpha_1 \bar{a}_1 - \alpha_1 K \bar{a} + \alpha_2 V \bar{a}) + [\alpha_1 K \bar{a} - \alpha_2 V \bar{a}]}{X_2 (\alpha_1 \bar{a}_2 - \alpha_1 K \bar{a} + \alpha_2 V \bar{a}) + [\alpha_1 K \bar{a} - \alpha_2 V \bar{a}]} - 1 \\ &= \frac{X_1 [\alpha_1 (\bar{a}_1 - K \bar{a}) + \alpha_2 V \bar{a}] - X_2 [\alpha_1 (\bar{a}_2 - K \bar{a}) + \alpha_2 V \bar{a}]}{X_2 [\alpha_1 (\bar{a}_2 - K \bar{a}) + \alpha_2 V \bar{a}] + [\alpha_1 K \bar{a} - \alpha_2 V \bar{a}]} \quad (4.8) \end{aligned}$$

This equation shows that the difference in utility and the resulting required price discount β for brand II depends

on "true" and perceived product performance, on consumer information, the degree of risk aversion, and the degree of consumers' skepticism towards new brands, K . For example, it can be demonstrated that if both brands I and II were of average quality ($\bar{a}_1 = \bar{a}_2 = \bar{a}$), the assumed K were 1, and consumers did not show risk aversion ($\alpha_2 = 0$), no discount would be required. For then, (4.8) collapses to

$$\beta = \frac{\alpha_2 \cdot V\bar{a} \cdot (X_1 - X_2)}{\alpha_2 \cdot V\bar{a} (X_2 - 1) + \alpha_1 \bar{a}} \quad (4.9)$$

where the numerator is zero.

Next, we consider the case where α_2 is positive; it is here that the idea of brand loyalty as a sign of habitual behavior enters the model. If we accept that the denominator in (4.9) is positive, the condition for β being a positive number (i.e. a real discount, not a premium) is a greater value for X_1 than for X_2 , in other words, the degree of consumer information about the brand of the established firm must be higher than the one about the brand of the new entrant.

But which factors determine the size of X_i ? The sources of information were listed in section 3.2 above, and Comanor and Wilson group them under two headings (1974, p. 33): the informational content of advertising messages and other selling efforts (A_i), and the accumulated information that is due to consumer experience (E_i). An

information production function is postulated of the general form

$$X_i = f(A_i, E_i) \quad (4.10).$$

Substituting from (4.10) for $i=2$ into (4.8) and solving for X_2 gives

$$X_2 = f(A_2, E_2, \dots) = \frac{X_1[\alpha_1(\bar{a}_1 - K\bar{a}) + \alpha_2 V\bar{a}] - \beta[\alpha_1 K\bar{a} - \alpha_2 V\bar{a}]}{(\beta + 1)[\alpha_1(\bar{a}_2 - K\bar{a}) + \alpha_2 V\bar{a}]} \quad (4.11)$$

the trade-off function for the second brand between the required price discount β and the level of advertising expenditures, A_2 , to counter the effect of no consumer experience with the product.

To examine the nature of this trade-off, we take eq. 4.8 and regard the terms in brackets as constants, so that

$$\beta = (X_1 L - X_2 M) / (X_2 M + N) \quad (4.12),$$

and see how β changes with changes in selling efforts of both the established firm and the newcomer. Using chain rule and quotient rule, the partial derivatives are obtained:

$$\frac{\partial \beta}{\partial A_1} = \frac{(\partial X_1 / \partial A_1) [L(MX_2 + N)] - (\partial X_2 / \partial A_1) [M(LX_1 + N)]}{(MX_2 + N)^2} \quad (4.13)$$

What eq 4.13 demonstrates is the importance of cross-over effects, that is the impact of one firm's selling efforts on consumers' information about the competitor's brand.

What happens to the entrant's selling expenses if the

incumbant firm increases its advertising outlays? We apply the implicit-function rule to (4.8) and obtain

$$\frac{dA_2}{dA_1} = \frac{(\partial X_1 / \partial A_1) [L(MX_2 + N)] - (\partial X_2 / \partial A_1) [M(LX_1 + N)]}{(\partial X_2 / \partial A_2) [M(LX_1 + N)] - (\partial X_1 / \partial A_2) [L(MX_2 + N)]} \quad (4.14)$$

(Comanor and Wilson, 1974, p. 35; the authors erroneously assigned a positive sign to the second term of the denominator). "The question whether this derivative exceeds or is less than unity is crucial, for it will likely have a major impact on the returns from being first in those markets where advertising and promotion significantly affect consumer decisions" (ibd.). Equation 4.4 contains direct effects as well as cross-over effects $(\partial X_i / \partial A_j)$. If we examine the case where cross-over effects are absent and think of $X_1 = X_2$, dA_2/dA_1 will be greater than one if the established firm's advertising and promotion will be more effective than that of the entrant, at the same level of information for both brands (and provided that $L > M$). One might of course think that the marginal effectiveness of a new brand is greater than the one of an established brand, since advertising for a new brand reaches more potential customers who have not at all heard of it before. But this pertains to effectiveness at the same level of selling efforts A_1 . Look for example at amount B in figure 4.1: the slope of the information production function for brand II is bigger than that of the function for brand I. But in order to force the price discount β to

zero, it is necessary that the degree of consumer information is about the same size for both brands, as long as consumers are risk averse. For a special case, this was shown in eq. 4.9, and though the exact result varies gradually if we relax those assumptions, the basic statement holds. As the curves are drawn in fig. 4.1, the marginal effectiveness of advertising at information level Y is bigger for the established brand than for the new one, so dA_2/dA_1 exceeds unity (Comanor and Wilson, 1974, p. 37/8). An intuitive explanation is that an increase in the degree of information about brand I is brought about by experience and selling efforts which are (imperfect) substitutes in the information production function (4.10). This means that for a given increase in information, a

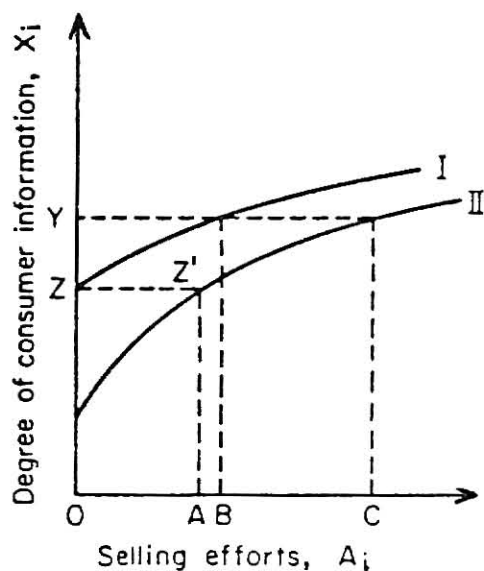


Fig. 4.1:
Production functions relating
consumer information to selling
efforts of new and established
firms

Source: Comanor and Wilson,
1974, p. 37.

smaller increase in advertising and other selling efforts is necessary for brand I than for brand II, in other words: curve I is steeper.

Where dA_2/dA_1 is greater than one, "the prospect that the returns of established firms will contain a significant element of economic rent is increased" (ibid., p. 36). For in this case, advertising serves as a barrier to entry.

So far, this possibility has been stated in different ways: in the absence of a choice of advertising strategies, a price discount is necessary which may deter the entrant; or the required advertising expenditures to gain full brand acceptance could be preventive to entry.

4.3 Advertising, brand loyalty, and barriers to entry

The model of consumer choice presented above rests substantially on the idea of brand loyalty as an outflow of habitual behavior. A more formal treatment of this concept is attempted now.

Schmalensee (1974) proceeds from searching a mechanism through which loyalty is created or eroded. A consumer will stay with an established brand until he has received a critical number of advertising messages from an entrant which cause him to try the new brand. A consumer is said to be "dynamically loyal if it is expensive and/or takes a

long time to alter his purchase probabilities" (Schmalensee, 1974, p. 580). Brand loyalty as well as consumer inertia is then modeled by a demand structure characterized by distributed lags.

Consider a market with one entrant which sells Q units in period t , spending amount A for advertising at the same time. The equivalent variables for the only established firm are \bar{Q} and \bar{A} . Furthermore, we assume price uniformity and constant and identical unit production costs. Actual sales adjust towards equilibrium (or potential) sales Q^* according to a general distributed lag mechanism. For the entrant:

$$Q(t) = \sum_{i=0}^{\infty} w_i \cdot Q^*[A(t-i), \bar{A}(t-i)] \quad (4.15)$$

where $\sum_{i=0}^{\infty} w_i = 1$. For the established firm:

$$\bar{Q}(t) = \sum_{i=0}^{\infty} \bar{w}_i \cdot \bar{Q}^*[\bar{A}(t-i), A(t-i)] \quad (4.16)$$

where $\sum_{i=0}^{\infty} \bar{w}_i = 1$.

Schmalensee shows that the present value of the established firm's profit can be split into two parts (his eq. 10, p. 582). One of them is the present value of the profits that would accrue to the established firm if it ceased advertising immediately and forever. This is a positive constant and can be treated like a bond in that it is fixed income. It is argued that the size of this bond would have no effect on the returns from any firm's present or future promotion, and thus can have no

influence on any rational decision-maker. This statement holds only if capital markets are perfect. For imperfect capital markets, however, brand loyalty might give the established firm a cost advantage, since the bond is a collateral which allows lenders to advance the firm any amount up to its value without incurring any appreciable risk. Since potential entrants do not have collateral of this sort, they might be forced to pay higher interest rates for borrowed funds, given a lack of other valuable assets (Schmalensee, 1974, p. 583). This creates an absolute cost advantage, a barrier to entry.

Aside from this inherent advantage of established firms, the relevant questions are (Folsom et al., 1983, p. 47):

- Can established firms' advertising bar entry, while their own businesses remain profitable ?
- If established firms can use advertising to bar entry, is it optimal for them to do so ?

The nature of the post-entry behavior of established firms as it is anticipated by potential entrants plays an important role. We can apply eq. 2.21, i.e.

$$a = a^i + \eta^i \cdot \bar{a}^i ,$$

where 'a' now pertains to the entrant and ' \bar{a} ' to all established firms (Needham, 1976, p. 35). If the entrant conjectures that the old firms will increase their advertising spending in prospect of him trying to gain market

shares, η^+ will be a positive number and, assuming \bar{a}^+ is negative, will probably discourage him from entering.

To return to the first question from above, the crucial point is whether the established firms earn still positive profits. For if the attempt to bar entry leads to zero economic profits, it is irrelevant whether the entrant finally succeeds or not: the barriers which were erected are then undermined anyway.

Schmalensee, in his model, considers two situations under which established firms could be successful. First, there might be an asymmetry in demand functions which results either from different lag distributions in (4.15) and (4.16) or from the Q^* and \bar{Q}^* functions. Differences in the lag distributions are viewed as a result of consumer inertia, leading to less effective advertising for the entrant. Under the given assumptions about costs and prices, profit per period for the established firm is higher than that of the entrant if the entrant's w_i weights are smaller than the established firm's \bar{w}_i for recent periods, i.e. small i . In an industry where total equilibrium sales do not change with the new firm entering the market, this occurs only if industry sales first decline and then increase in the transition period. This reaction does not sound quite probable (Schmalensee, 1974, p. 584).

Differences between the Q^* and \bar{Q}^* functions have nothing to do with brand loyalty, because these functions are independent of the dynamics of consumer response to advertising. Since the arguments of these functions are A and \bar{A} , differences rather reflect a higher product appeal or better promotional skills for one of the firms. Schmalensee (ibid.) sees no reason why this should act to the advantage of the established firm.

A second situation where established firms can successfully deter entry emerges from asymmetric firm behavior. For example, the entrant may naively assume that the established firms will not react on his advertising decision (Cournot assumption, $\pi_L^1 = 0$), while these are aware of his naivete and can act in concert to take advantage of it. Under special, but reasonable assumptions for the Q^* and \bar{Q}^* functions, it can be shown that it is possible for the established firms to force A to zero through increased own advertising.

After evaluating the possibility of such a strategy, the question arises if it is reasonable, i.e. if the established firms' profits remain positive in doing so. It is demonstrated (ibid., p. 585) that again a demand asymmetry is required for deterring entry to be a reasonable strategy, and this does not yet mean that it is an optimal strategy. For an entrant which does not behave in such a naive way, a "quite extraordinary demand asymmetry" is

required to exclude him (ibid., p. 586).

Schmalensee's model has been criticized on the ground that it totally depends on advertising outlays (Folsom et al., 1983, p. 49). Current sales Q are a function of potential sales Q^* which in turn depend solely on advertising. Instead, it is said, current actual sales should also be a function of past sales. This omission creates some anomalies in the model (ibid.):

- 1) each firm's potential sales are reduced if the competitors advertise more (cf. equations 4.15 and 4.16), but not if they sell more. Since Schmalensee dealt with a situation where "advertising is the only competitive weapon" (1974, p. 587), it is no wonder that methods of price policy to overcome habitual behavior were not considered.
- 2) The value of the bond which possibly is an absolute barrier to entry is underestimated in the model. It is assumed to be the present value of the profit from future sales generated by past advertising. But here, a similar criticism as in 1) holds: this model omits the beneficial effects from past advertising of established firms on their own future sales, due to buying habits that are continually reinforced by their current sales. Vice versa, this means that resulting damages for a prospective entrant's future sales are

neglected, too.

- 3) The model discussed before fails to take into account the effects of consumers' risk aversion which were an important feature in the Comanor-Wilson model.

All these shortcomings together tend to bias the model towards a conclusion that advertising cannot profitably bar entry.

The previous model can be generalized, to account for the points of critique no. 1) to 3) through making current actual sales (of both the entrant and its opponents) an argument in the Q^* (and \bar{Q}^*) functions. This new model will not be discussed here in detail, but the result for an asymmetry in behavior as described by Schmalensee is given (Folsom et al., 1983, p. 61): "Even if planning horizons, markups, costs of financial capital, and lag structures are all equal for the two firms, the established firm's optimal strategy may be to advertise enough to bar entry".

5 Synopsis of conflicting theories and an attempt of a resolution

5.1 Two schools of thought

The models of the relationship between advertising, market structure, and competition which were discussed in the two previous chapters show opposite schools of thought about the fundamental effect of advertising on competition. To indicate the contrast, they were labeled in a catchy way, like "advertising = market power" versus "advertising = information" (Albion and Farris, 1981, p. 30), or "anti-competitive theory" vs. "competitive theory of advertising" (Gomes, 1986; of course, not the theories are anti- or pro-competitive, but the subject).

The Comanor-Wilson-model (ch. 4) is based on the former theory. It rests on the assumption of brand loyalty as an outflow of consumers' habitual behavior. Brand loyalty tends to give established firms an advantage opposite to entrants. Advertising is seen as creating such brand loyalty in that it differentiates the product from those of competitors.

The following effects of advertising are distinguished (Albion and Farris, 1981, p. 89):

- Introduction of new attributes into the consumer's choice decision.
- Influence upon the consumer's assessment of the

product's performance on a given attribute.

- Influence upon the combination of product attributes regarded as "ideal", i.e. influence upon the preference function.

What are the effects on market structure and competition? Since the substitutability of brands is limited after successful product differentiation, price competition is reduced. Entry barriers are said to be strengthened by advertising (see ch. 4), the more so as there supposedly exist economies of scale in advertising (Comanor and Wilson, 1974, pp. 49-60). These may result from increasing productivity with a rise in the number of advertising messages released by a firm, and/or from price discounts per message for large advertisers. (This interesting issue will not be discussed further.)

Taken these facts together, it seems that advertising insulates firms from market competition and potential rivals; concentration increases, leaving firms with more market power.

One troublesome aspect with this argument is that it implies a causal flow from advertising to concentration. But in chapter 2, it was shown that in oligopoly the opposite could be true, too: with fewer (and - given equal market size - larger) firms in the market, these may advertise more to maximize profits. Some economists pro-

pose that the causality runs both ways. For empirical studies, this causes statistical problems of measurement error and interpretation of results, but the vastly differing implications for public policy are probably worse. In one sentence: "it can be seen that the theoretical background is quite messy" (Albion and Farris, 1981, p. 61).

Philip Nelson developed major ideas for the "advertising = information" school (cf. ch. 3). As is evident from the label, the information contents of advertising is stressed here. While the consumers extract a significant amount of information from advertising, this does not change the way they value attributes of a product. The possibility that advertising is a way to differentiate products is denied. Since consumers can compare competitive offerings easily, competitive rivalry is increased, and barriers to entering a market are lowered. Assuming a cost difference among firms, it was shown (cf. ch. 3) that low-cost firms have a higher incentive to advertise. If market demand cannot be extended, these more efficient firms gain market shares from less efficient ones (Gomes, 1986, p. 603). If concentration eventually increases, this is due to cost differences, not to advertising.

This theory contains critical assumptions (cf. section 4.1) about the degree of rationality which a consumer

employs in decision making. While the marketing literature lists persuasion as an obvious aim of advertising, this fact is denied in this theory.

Another possible point of critique is of course the strong statement about the informational content of advertising, a point that remains controversial despite empirical work aiming to test this assumption (cf. Resnik and Stern, 1977).

5.2 Conflicting theories about the effect of advertising on the price elasticity of demand

It is necessary to clarify the different predictions of both theories about the economic effects of advertising, especially the impact on market structure and competition. In order to do so it is useful to look at the predicted change in the price elasticity of demand facing the firm. As was noted earlier, this price elasticity can be regarded as a measure of market or monopoly power, since it is the reciprocal of the Lerner index for the profit-maximizing firm.

Empirical studies often take criteria of market structure, like concentration ratios, as a proxy of the degree of market power. A full critique of this approach is not attempted here, but it is important to note that a conclusion that high concentration also means a high

degree of monopoly power is sometimes erroneous.

First, a high level of concentration could be temporary, as is typical in young industries where only a few firms are active. These may reap high rates of return despite fierce competition, but the competitive process and the challenge of following firms will cut long-run economic profits.

Second, even when persistent high concentration ratios are measured, the identity of the biggest firms in the market may change over time. In this case, a high CR does not indicate the existence of market power.

Both cases reveal that the existence of substantial barriers to enter a market is the crucial link from concentration in the market to market power. The price elasticity of demand indicates a firm's ability to raise price above marginal cost and is therefore a better measure of monopoly power. Though it refers to a firm's behavior, it might be counted as a meaningful measure of market structure.

The "advertising = market power" theory stresses the ability of advertising to add to or even to create a unique product image. Reduced substitutability of different brands for each other also means lower cross-elasticities of demand. Therefore the own-price elasticity of demand is reduced in absolute value which follows from the

homogeneity relationship.

The "advertising = information" theory predicts a rise in the absolute value of the price elasticity for a brand (or a firm which is marketing just one brand). The argument runs like this (Nelson, 1975): the elasticity of demand for a brand is determined by the number of brands which are viewed as close substitutes by consumers. Product differentiation and lack of consumer information are two quite different sources of demand inelasticities. If consumers have no information about a product or brand, it is less likely to get into their samples. So consumers' choice is narrowed to a smaller number of brands, resulting in a lower price elasticity of demand for the producers of those brands.

One consequence of advertising, as was argued in section 3.4, is that it guides demand to brands which provide a higher utility per dollar, in other words have a lower price per unit of utility. At this lower price, it is expected that the market demand curve has a lower absolute value of elasticity. But, as stressed before, this is not the relevant elasticity in this context.

For search goods, advertising lowers the cost of search. Nelson (1975, p. 222) states: "the consumer will simply search by way of advertisements instead of going to the store". Thus advertising increases the optimal sample size

resulting from the consumer's optimization procedure, and as a consequence, the value of E goes up.

For experience goods, the price elasticity of demand for a brand is the weighted average of the one for consumers who are still experimenting and those who finished this process. For the first group, E takes on a value of zero: demand is not influenced by changes in price within the experimenting period, with or without advertising. The weight given to the experiment period for calculating the average elasticity does not change with advertising, provided that the number of advertised brands is at least as high as a consumer's optimal sample size (ibd., p. 223).

What about the impact of advertising on the elasticity after the experimentation period is over? Here, a certain definition of "product differentiation" is applied; namely the standard deviation of P^* (the price per unit of utility), a measure which depends on the probability density function of P^* . With advertising, the consumers restricts sampling to heavier advertised brands so that his sample contains brands with a lower average P^* and also has a smaller standard deviation. This last fact implies that advertising leads to a lower (specially defined) degree of product differentiation. It can also be shown mathematically that this effect raises the value of E for experience goods (ibd., p. 224).

The used definition of product differentiation seems to be

invalid. In the beginning, product differentiation and lack of information were termed independent sources of demand inelasticities. But the standard deviation of P^* which is used as a simple, one-dimensional measure of product differentiation implies that it is dependent on the degree of consumer information. Thus assuming identical utility functions for all consumers, product differentiation is thought of merely as a consequence of some consumers' ignorance.

To remedy this shortcoming, a separation between "good" and "bad" product differentiation was introduced (ibid., p. 225). If the assumption of identical utility functions of all consumers is relaxed, consumers will disagree about some qualities of a product. "Good" product differentiation which is created by advertising allows them to obtain qualities more closely related to their tastes.

This distinction between different values of product differentiation has an important implication which helps undermine the whole theory: even "good" product differentiation is able to create a large number of brands in the market, given consumers' diverging tastes, and because the selection of brands has to be broad enough even among those brands whose features are closely related to a single consumer's taste. The drawback is that a large number of brands in a market can per se produce barriers

to entry. This can be illustrated using a model of spatial competition. With symmetric demand conditions (for established firms and newcomers), but assuming economies of scale in production and marketing, established firms can force an entrant's profits to zero while keeping their own businesses profitable (Schmalensee, 1978).

A final counter-argument arises if we put ourselves in a firm's position and ask: why should a firm advertise at all if advertising does not serve as a means to differentiate a product and reduce the price elasticity of demand, but effects just the opposite? Large advertisers would then frustrate their own purpose.

But there is an explanation of this counter-productive effect of advertising: advertising outlays by one firm can provoke competitors to retaliate by raising their own advertising expenditures. (In terms of eq. 2.21, this means a high value of η^1 .) With increasing overall level of advertising intensity in the industry, advertising messages might cancel out each other, but also might redirect the consumers to look at the price of brands. In this hypothetical way, consumers' price elasticity of demand might indeed increase. The competitive reactivity of the market determines if this really happens or not (Gatignon, 1984).

Neither of both opposite theories about the impact of

advertising on the price elasticity of demand can be accepted or rejected a priori, and the matter gets even more controversial since each of them is able to provide a certain amount of favorable empirical evidence.

One possible way to resolve this issue lies in the following consideration. While the "advertising = market power" theory is applicable on differentials in advertising intensity and their effects, the "advertising = information" theory is useful in comparing markets where advertising is nonexistent with those where it is. Case studies indicate that the informational function of advertising leads indeed to lower prices on markets where it is allowed than exist on spatially separated markets where it is prohibited (Kwoka, 1984; Glazer, 1981).

Besides this approach, there is another concept which provides useful insights into the effects of advertising and the applicability of the two different schools of thought. This takes into account the vertical structure of the marketing system.

5.3 The impact of manufacturer-retailer interaction

5.3.1 Relevant characteristics of the food marketing system

The food marketing system comprises both manufacturing and distributing sectors, i.e. wholesalers and retailers. In part, vertical integration leads to ownership of more than

one of these stages in one hand despite their diverging functions.

Food products are consumed either at home or outdoors. In the former case, they are mostly purchased at retail stores, in the latter one they are mostly consumed where they are purchased, at restaurants and catering institutions. In our context, franchising in this part of the food system is equivalent to vertical integration, and the reason for this will soon become obvious.

The ultimate goal of advertising for a food manufacturer (cf. chapter 1) is to enhance his profits by drawing attraction on his brand. Since consumers are the final users, they are one of the target groups of manufacturers' advertising. They are the only one if the manufacturer is directly selling to them, or if - as is the case for franchised restaurant chains - only brands of the one manufacturer are available at an outlet to consumers.

But for food products sold at retail stores, there is another target group for the manufacturers' promotional efforts, the distributive sector. For simplicity, we can assume that it consists only of one stage, the retailers, which nowadays are often vertically integrated into the wholesale sector. So the assumption of no wholesaler should not be a serious omission (Albion, 1983, p. 69).

The retailers' relevant characteristics are: they are

multiproduct firms, selling thousands or tens of thousands of different articles - manufacturers' brands and private labels as well as generics - to consumers. The development of large food chains during the last decades occurred together with the rise of a considerable market power, so that the retail stage may not be viewed as a price taker for manufacturers (Marion et al., 1979). Retailers' profits are the sum of the products of net retail margin and turnover for each single item. This together with the notion that not all products have the same importance allows one to formulate the following statements about the role of advertising in the interaction of the elements of the system.

Manufacturers' advertising directed at consumers has a certain power over retailers by increasing the percentage of preshopping decisions by consumers on what to purchase (Albion, 1983, p. 98). Consumers looking for a heavily advertised brand at their retail store want to find it there and are disappointed if they don't, eventually resulting in a switch among stores. Thus, the manufacturer is able to influence the retailer's shelf allocation decision in a second way besides the direct one. This influence depends on the manufacturer's reputation and is not of equal importance for all products, but especially for those which have a larger share in consumers' market basket and/or have a high frequency of purchase.

Given these restrictions, one may stand the last argument on its head and say that a successful advertising campaign depends on retailers' willingness to stock the brand and offer it for sale. Therefore, access to retail shelf space might become an important barrier to entry in manufacturing industries.

5.3.2 Convenience versus nonconvenience goods

The manufacturer-retailer interaction is observed more closely in Porter's (1976) model of interbrand choice. Market power of retailers is caused by structural traits as well as their ability to differentiate a product. The retailer's contribution to product differentiation is the influence he exerts on the purchase decision of the consumer which is applied in two major ways (Porter, 1976, p. 21). First, the retailer controls or embodies some of the product attributes: the store's reputation and image, and the quantity and quality of services are examples. Second, the retailer provides direct information to the consumer by way of selling presentation and personal recommendation, thus helping to form the consumer's perception of the product.

Recognizing that buying characteristics vary between products, it is postulated that the characteristics of the

retail channels for a product will reflect the characteristics of consumer demand. Porter suggests a dichotomy of retail outlets (ibid. p. 23):

- Convenience outlets: Retail outlets where little or no sales assistance in the form of salesperson interaction is provided with the sale and the locational density of outlets is high.
- Nonconvenience outlets: Retail outlets where sales assistance is provided with the sale, and outlets are selectively rather than densely located.

Food items are a good example for products sold in convenience outlets, so called convenience goods. Low unit price and frequent purchase reduce the consumer's search effort, so that relatively costly sources of information like sales assistance by the retailer and shopping around are not utilized by the consumer.

As a consequence, the manufacturer's strategy for differentiating his product should be to develop a strong brand image through advertising. This will create consumer demand for the product which forces the retailer to stock his brand, as described above. In this process, a threshold effect exists for the manufacturer which in short leads to diminishing marginal costs of market share (ibid., p. 28).

In summary, direct advertising to the consumer is the dominant form of selling efforts by the manufacturer of

convenience goods. It is supposed to be a good measure of product differentiation and of the manufacturer's market power towards the retailer.

Nonconvenience goods have a relatively high value per purchase, and the purchase is infrequent and postponable. The buyer therefore puts a greater effort in acquiring information by salespersons, shopping and comparing goods. Physical product characteristics will therefore take on more importance in differentiating products. The contribution of the retailer to product differentiation will also increase, and hence his bargaining power towards the manufacturer.

Manufacturers' promotional efforts are then directed towards consumers, but for a significant part also towards retailers. Not only have these to be convinced to stock the product, but retailers' salespeople have to be trained and motivated.

As a consequence, advertising is a doubly poor measure of market power for nonconvenience goods (*ibid.*, p. 33): it is a less precise measure of product differentiation, and it is not a good indicator of a manufacturer's bargaining power vis-a-vis the retailer, since it neglects other promotional efforts necessary to persuade the retailer.

The hypothesis of the different relationship between

advertising intensity and market power for convenience and nonconvenience goods was tested in a sample of 42 4-digit consumer goods industries. With profit rates as a measure of performance and the advertising-sales ratio (A/S) as one of several explanatory variables, the coefficient of A/S was highly significant for the whole sample, even better for the subsample of convenience goods industries, but insignificant for nonconvenience goods industries (Porter, 1976, pp. 144-147). Therefore, a major conclusion is "that the character of consumer demand for information may well influence the economic effects of advertising in a product market" (Albion, 1983, p. 65).

5.3.3 The relationship between advertising and price elasticity of demand in a dual-stage model

It is possible to elaborate this idea further and, focusing on food and other convenience goods, differentiate between advertising's effects on prices for the manufacturer and retail prices. The manufacturer wants to obtain the highest possible factory price and a consumer price for his brand as low as possible to achieve high sales volume (ibid., p. 49), and as we shall see, advertising could be a means to reach both of these aims.

The following impacts of advertising which create additio-

nal revenue for the manufacturer are overlooked if we take a single-stage model of marketing instead of the proposed two-stage model (R.L. Steiner, in: Albion, 1983, pp. 49 ss.):

- increased retail penetration. A manufacturer can increase the number of outlets carrying his brand without making the price concessions to the retailers which were required before he started to advertise.
- Increased dealer support and decreased gross distribution margin. If a brand has become well-known to consumers, the retailer is forced to store it. But even more interesting, retailers may begin to compete with each other on the prices for that advertised brand, so that its average consumer price goes down, because the retailers' margin is reduced. The background is that "consumer use well-known advertised brands as a benchmark to compare prices among retailers. Without a known quality/price benchmark, consumers have difficulty recognizing price differences among stores. Retailers recognize this fact and discount these advertised brands to achieve reputations for low prices" (Albion, 1983, p. 53).

These aspects have been used as elements of a model of the advertising life cycle (Steiner, in: Farris and Albion, 1980; Albion, 1983). The fourth and last stage of this

cycle, however, which is called "maturity", does not show a definite effect of advertising. Instead, this effect is hypothesized to depend on the kind of manufacturers' marketing strategies, i.e. their usage of either manufacturers' brands or private labels. But what the model (resting on the effects of advertising described above) shows is that advertising can decrease price elasticity for the manufacturer and at the same time increase the price elasticity facing the retailer. So a manufacturer of a well-known brand can create market power and thereby influence market structure and performance in his industry, while on the other hand the argument of the "advertising = information" theory is valid at the consumer level. This especially happens in product categories that are "traffic builders", like meat products.

This model has been criticized (among other reasons) because it is supposedly inconsistent with the economic theory of derived demand (Ferguson, 1982, p. 103). According to this theory, retailers' demand for the manufacturer's product is derived from consumer demand at retail outlets. The more elastic the demand at retail level, the more elastic will be the retailers' derived demand. But since empirical evidence is supporting the model presented before, one should rather question the applicability of the theory of derived demand to multiproduct retailers with nonexclusive

arrangements (Farris and Albion, 1982, p. 107).

6 Summary and conclusions

This paper discussed some of the questions related to brand advertising by manufacturing firms. The focus was on food products, for which advertising is likely to play a more and more important role.

A useful point to depart from was to deal with the subject from a firm's point of view. This lead to the question why firms employ advertising at all. But the paper had to deal with economic problems rather than with business problems. The key question was: what is the kind and direction of the relationship between advertising, market structure, and competition?

Price theory can be used to predict the relative level of advertising expenditures for a firm (and, through aggregation, for a market), if it behaves in a profit-maximizing way. The independent variables are the type of market structure, i.e. the number and size distribution of sellers (an admittedly simplifying definition), and the relative effectiveness of advertising and price policies as reflected in the particular elasticity measures. One point of dispute in the literature is the question whether advertising should be treated as a variable expense or as an investment which has to be depreciated. In the latter case, we have to employ a dynamic analysis. For the monopoly case, it has been shown that the results of static

and dynamic analysis are equivalent, if one compares the long-run elasticities in the dynamic analysis with the elasticities in the static approach. The monopolist is predicted to advertise the more, the more he can increase sales by way of higher advertising compared to a reduction in prices.

In a static analysis of the oligopoly case, the crucial assumptions pertain to the firm's conjectures about rivals' reactions to its advertising campaigns, and on the relative effectiveness of advertising by different firms. A single firm's optimal advertising intensity (measured as ratio of advertising expenditures to sales revenues) will rise with its market share. With varying numbers of firms in a market, advertising intensity is expected to reach its maximum in a narrow oligopoly. This statement holds as long as firms do not collude with respect to advertising, and the degree of monopoly power depends on the number of market participants.

Next, it was indicated to look at advertising as a cause of change in market structure and competition. In real world consumer markets, differentiated products are traded, because it is not costless for consumers to obtain information about products. Then, consumers will not acquire all information about relevant characteristics of a brand or product, but only up to a point where the

marginal utility of additional information equals its marginal cost.

A dichotomy has been postulated concerning the method of information acquisition. Dependent on product characteristics, consumers will obtain information either by way of search or through experience. A consumer's optimal sample size will be higher for search than for experience goods, and therefore the sellers' market power is expected to be higher in markets for the latter category of goods.

Advertising supposedly contains information about all relevant attributes for search goods. For food products as experience goods, advertising will primarily transmit indirect information, namely that the brand is advertised. Since advertised brands are said to be better buys, advertising increases a brand's reputation and its sales, but that takes a higher advertising intensity than is prevalent for search goods. All in all, a relatively high degree of monopoly power associated with a high advertising intensity is predicted for food products.

Consumers are better informed about brands which existed in a market for a long time, both from experience and past advertising. If consumers act risk-averse, a new brand has to be sold at a price discount or has to be advertised heavily, even if its true performance is equal to that of the established ones. This is a result of brand loyalty of

consumers which itself is possibly strengthened by advertising. More important, their advertising policy enables established firms to deter entry, if their marginal effectiveness of advertising exceeds that of newcomers. The question whether the established firms can remain profitable if they try to deter entry, depends crucially on the assumptions about the behavior of both incumbents and potential entrants.

From the previous models, it was recognized that researchers obtained controversial conclusions about the relationship between advertising, market structure, and competition. The "advertising = market power" school stresses the ability of advertising to create ("bad") product differentiation, reduce the price elasticity of demand, and increase a manufacturer's monopoly power. The "advertising = information" school refuses these conclusions, arguing that advertising provides (supposedly objective) information to consumers, thereby enhancing competition. Under certain assumptions, advertising increases the price elasticity of demand. But it is also shown that by the same argument, advertising can create "good" product differentiation which acts per se as a barrier to entry.

In an attempt to resolve the seeming conflict, it is argued that the "advertising = market power" theory is

applicable on differentials in advertising intensity, while the "advertising = information" theory is useful in comparing markets where advertising exists with those where it does not. Furthermore, the vertical structure of the marketing system has to be considered, since e.g. for food products, the retail sector cannot be taken as perfectly competitive. Consumer goods can be classified into convenience and nonconvenience goods according to the characteristics of the retail channels in which they are sold. For convenience goods (like food), manufacturers' advertising is a good indicator of product differentiation and of the manufacturers' market power towards the retailers.

Manufacturers' advertising permits an increased retail penetration and may cause fiercer competition for that brand on the retail level, leading to a shrinking retail margin. This means that a manufacturer of a well-known brand can gain market power, but his advertising for the brand can nevertheless lower its consumer price, indicating a positive (short-term) effect of advertising on competition at the retail level.

These last arguments need to be qualified further by category of food products, what was neglected in this report. A few qualifications allow interesting distinctions between different food categories concerning

the effects of advertising. For instance, the degree to which a product can be differentiated also depends on its physical characteristics. This implies a higher effect of advertising for relatively highly processed food products. Also, advertising is more likely to increase retail price competition for products which are important in retailers' profit calculations. While some food products like meat fulfill this condition, others do not. These qualifications are regarded as a foundation for future empirical research.

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INTERRELATIONSHIPS OF MANUFACTURERS' BRAND ADVERTISING
AND MARKET STRUCTURE IN THE FOOD MARKETING SYSTEM

by

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ABSTRACT

The report discusses questions related to manufacturers' brand advertising (especially for food products) in order to find relationships between advertising, market structure, and competition.

Price theory is able to predict the relative level of advertising expenditures for a profit-maximizing firm. A monopolistic firm is predicted to advertise more, the more it can increase sales by way of higher advertising compared to a reduction in price. The result is equivalent, if advertising costs are regarded as investment. Advertising intensity is expected to reach its maximum in a narrow oligopoly, using Cournot's assumption.

Advertising can also cause itself changes in market structure and competition. One model postulates a dichotomy of search goods versus experience goods (such as food products), concerning the methods of information acquisition by consumers. Sellers' market power is expected to be higher for experience goods. Advertising for experience goods contains little direct information (opposite to that for search goods). However, together with a high expected advertising intensity, it guides demand to the advertised brands, since consumers have reasons to believe that it is a better buy.

Risk aversion by consumers and a higher degree of informa-

tion about established brands in a market result in brand loyalty. A new brand has then to be sold at a discount, or has to be heavily advertised. More important, advertising, strengthening brand loyalty, is able to work as a barrier to entry. A crucial condition is that the established firms remain profitable in trying to deter entry.

It is recognized that researchers obtained opposite conclusions about the effect of advertising on the price elasticity of demand facing a firm or brand. The diverging positions are contrasted, and in an attempt to resolve the conflict, it is argued that the "advertising = market power" theory is applicable on differentials in advertising intensity, while the "advertising = information" theory is useful in comparing markets where advertising exists with those where it does not.

Furthermore, the vertical structure of the marketing system has to be considered. For convenience goods like foods, manufacturers' advertising is a good indicator of product differentiation and monopoly power. On the other hand, it may lead to more competition at the retail level and thus is able to reduce consumer prices.